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<p>(21) International Application Number: PCT/US99/06384</p> <p>(22) International Filing Date: 23 March 1999 (23.03.99)</p> <p>(71) Applicant (for all designated States except US): THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK [US/US]; Broadway and 116th Street, New York, NY 10027 (US).</p> <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): SEMRET, Nemo [CA/US]; Apartment 5C, 45 Tiemann Place, New York, NY 10027 (US). LAZAR, Aurel [US/US]; 410 Riverside Drive, New York, NY 10027 (US).</p> <p>(74) Agents: TANG, Henry et al.; Baker &amp; Botts, LLP, 30 Rockefeller Plaza, New York, NY 10112-0228 (US).</p>		(81) Designated States: CA, JP, US.  Published <i>With international search report.</i>
<p><b>(54) Title:</b> SYSTEM AND METHOD FOR PERFORMING A PROGRESSIVE SECOND PRICE AUCTION TECHNIQUE</p> <p><b>(57) Abstract</b></p> <p>A system and method for allocating a resource using a progressive second price auction technique. An auction is held for a limited resource, such as bandwidth in an Internet Service Provider Network in which bids are submitted by prospective users (103) including the quantity desired and the price for each unit of resource bid upon. In order to make an efficient allocation, a new bidder (105) is granted some of the resource based upon the availability of the limited resource (109) due to the bids higher than the new bidder (113). The actual price paid (121) by the new bidder is based upon bids made with lower prices who have been or would have been allocated some of the resource. This calculation of the price paid encourages bidders to bid their actual valuation of the resources rather than engage in inefficient tactical bids.</p>		
<pre>     graph TD         START([START]) --&gt; RETRIEVE_LIST[RETRIEVE LIST OF BIDS]         RETRIEVE_LIST --&gt; RETRIEVE_NEW[RETRIEVE NEW BID S<sub>i</sub>]         RETRIEVE_NEW --&gt; RETRIEVE_TOTAL[RETRIEVE TOTAL QUANTITY Q]         RETRIEVE_TOTAL --&gt; SET_Q[SET Q<sub>i</sub> EQUAL TO Q]         SET_Q --&gt; IDENTIFY_Next[IDENTIFY NEXT HIGHEST BID S<sub>j</sub> = (q<sub>j</sub>, p<sub>j</sub>)]         IDENTIFY_Next --&gt; Decision_Pj[DOES p<sub>j</sub> ≥ p<sub>i</sub>?]         Decision_Pj -- NO --&gt; Calc_Ai[A<sub>i</sub> = min(q<sub>i</sub>, q<sub>j</sub>)]         Calc_Ai --&gt; Insert_Bid[INSERT POSITION j INTO SORTED BIDS. INSERT LOWEST BID S<sub>i</sub> WHICH HAS OR WOULD HAVE BEEN ALLOCATED SOME QUANTITY]         Insert_Bid --&gt; Update_Ci[C<sub>i</sub> = C<sub>i</sub> + p<sub>j</sub> * [min(q<sub>i</sub>, q<sub>j</sub>) - min(q<sub>i</sub>, q<sub>i</sub> - q<sub>j</sub>)] a<sub>i</sub> = a<sub>i</sub> - min(q<sub>i</sub>, q<sub>j</sub>)]         Update_Ci --&gt; IDENTIFY_Next_Higher[IDENTIFY NEXT HIGHER p<sub>j</sub>]         IDENTIFY_Next_Higher --&gt; Decision_End[DOES a<sub>i</sub> = 0 OR IS p<sub>j</sub> &gt; p<sub>i</sub>?]         Decision_End -- YES --&gt; END([END])         Decision_End -- NO --&gt; Decision_Qi[DOES Q<sub>i</sub> = 0?]         Decision_Qi -- YES --&gt; END         Decision_Qi -- NO --&gt; Subtraction[Q<sub>i</sub> = Q<sub>i</sub> - q<sub>j</sub>]         Subtraction --&gt; IDENTIFY_Next     </pre>		